

Remarks

Claims 1 and 10 are amended herein, and new claims 16-22 are added. Upon entry of this amendment, claims 1-22 will be pending.

Response to Drawing Objection

- \* Applicant submits replacement sheet for Figures 1 and 2. Applicant notes that Figure 2 is an end view of the truss screw along the line II--II of Figure 1, not a cross-sectional view. The cross-section lines in Figure 2 were removed, and the replacement sheet now accurately depicts the end view along the line II--II.

Response to Claim Rejection Under 35 USC §102

Claim 10

Claim 10, as amended, is directed to a self-tapping screw comprising:

- a head;
- a tip;
- a shank having an outer surface;
- a screw thread having a uniform height projecting outward from the outer surface of the shank and extending from a start location between the head and the tip to the tip, the shank having a constant maximum radius at least from the start location to the tip;
- a drill section generally at the tip of the screw, the drill section being defined by at least one flute formed in the tip and the shank, the flute defining a cutting edge on the tip for forming a bore having a diameter equal to the diameter of the shank from the start location to the tip;
- the flute further defining a thread tapping edge at the intersection of the flute with the thread at a position nearest to the tip.

Amended claim 10 now recites, among other things, the screw thread having a uniform height projecting from the outer surface of the shank. A self-tapping screw having a thread with a uniform height is easier to manufacture than a self-tapping screw having a thread with a non-uniform height. Moreover, when a screw with a flute defining a cutting edge on the tip for forming a bore is thread into wood, a screw with thread having a uniform height is less likely to split the wood than a screw with a thread having non-uniform height.

Claim 10 is unanticipated by and patentable over the prior art of record, including particularly Holmes et al., U.S. Pat. No. 5,531,785, in that none of the references show or suggest a self-tapping screw that includes a screw thread having a uniform height projecting outward from the outer surface of the shank and extending from a start location between the head and the tip to the tip, a shank having a constant maximum radius at least from the start location to the tip, and a drill section having at least one flute defining a cutting edge on the tip for forming a bore having a diameter equal to the diameter of the shank from the start location to the tip.

Holmes et al. fail to disclose a screw with a thread having a uniform height. As shown in Figs. 1 and 2, the height of the thread (4) at a location closest to the tip (8) of the screw is less than the height of the thread at other locations, and therefore the height of the thread is non-uniform. Enlarged  
\* copies of Figs. 1 and 2 are attached hereto as Appendix A. The reduced height thread is shaded red. Holmes et al. do not disclose or suggest that the thread may have a uniform height.

Claims 11-15, 18, 19 and 21 depend directly or indirectly from claim 10 and are patentable for the same reasons as claim 10.

Response to Claim Rejections Under 35 USC §103

Claim 1

Amended claim 1 is directed to a screw comprising:

a shank;

a head at one end of the shank and a tip at the other end of the shank, the shank having an outer surface, the shank being of substantially constant maximum radius between the head and the tip;

a drill section formed on the shank and extending from the tip to an intermediate position between the tip and the head, the drill section having at least one flute defining a bore cutting edge at the tip of the shank which extends from a radially inner position with respect to said shank to the outer surface of the shank;

a screw thread formed on the outer surface between the head and the tip and terminating at the bore cutting edge, the screw thread having a uniform height projecting from the outer surface of the shank; and

the flute further forming a flute edge which intersects the screw thread between the tip and the intermediate position to form at least one thread tapping surface on the screw thread where the flute edge intersects the thread, so that when the screw is screwed into a work piece, the bore cutting edge drills a bore having a diameter substantially equal to the cross-sectional size of the shank, and the thread tapping surface cuts into the work piece to tap the bore and engage the screw thread with the work piece.

Like amended claim 10, amended claim 1 now recites, among other things, the screw thread having a uniform height projecting from the outer surface of the shank.

Claim 1 is non-obvious and patentable over the prior art of record, including particularly Holmes et al. in view of U.S. Patent No. 6,065,919 (Peck) in that none of the references show

or suggest, in combination or alone, a screw having a shank being of substantially constant maximum radius between the head and the tip, a drill section formed on the shank and extending from the tip to an intermediate position between the tip and the head, and a screw thread formed on the outer surface between the head and the tip and terminating at the bore cutting edge, where the screw thread has a uniform height projecting from the outer surface of the shank.

Peck discloses a self-tapping screw (1) with a double cutting point (14). The screw body (12) has a first thread (18) and a second thread (20). The diameter of the second thread (20) is less than the diameter of the first thread (18). Both threads (18,20) continue to a tip (24) (i.e., the apex of the screw) and turn to become substantially parallel to the length of the screw body (12) at substantially the tip. Column 3, lines 47-52.

As stated above with respect to claim 10, Holmes et al. fail to disclose a screw thread with a uniform height. Similarly, Peck also fails to disclose a screw having a screw thread with a uniform height. As shown in the Figures, as the threads (18,20) approach the tip (24), the heights of the threads decrease. More specifically, the heights of the threads drastically decrease as the threads turn to become substantially parallel to the length of the screw body at substantially the tip. Thus, Peck discloses screw threads having non-uniform heights. Peck does not disclose or suggest that one of the screw threads may have a uniform height. In fact, because the threads extend to the apex of the screw, the heights of the threads most likely will have to decrease in order for the screw to have a pointed apex to effectively initiate threading of the screw in the work piece.

Therefore, in view of the foregoing, claim 1 is non-obvious and patentable over the prior art references of record.

Claims 2-9, 16, 17 and 20 depend directly or indirectly from claim 1 and are patentable for the same reasons as claim 1.

New claim 22

New claim 22 is directed to a screw, comprising:

a shank;

a head at one end of the shank and a tip at the other end of the shank, the shank having an outer surface, the shank being of substantially constant maximum radius between the head and the tip;

a drill section formed on the shank and extending from the tip to an intermediate position between the tip and the head, the drill section having a pair of flutes defining a pair of bore cutting edges at the tip of the shank which extend from radially inner positions with respect to said shank to the outer surface of the shank, each flute defines an angle of about 90 degrees in a direction about the circumference of the shank;

a screw thread formed on the outer surface between the head and the tip and terminating at the bore cutting edges, the screw thread having a uniform height extending from the outer surface of the shank; and

the flutes further forming flute edges which intersect the screw thread between the tip and the intermediate position to form at least one thread tapping surface on the screw thread where the flute edges intersect the thread, so that when the screw is screwed into a work piece, the bore cutting edges drill a bore having a diameter substantially equal to the cross-sectional size of the shank, and the at least one thread tapping surface cuts into the work piece to tap the bore and engage the screw thread with the work piece.

New claim 22 requires a pair of flutes defining a pair of bore cutting edges and requires that each flute define an angle of about 90 degrees in a direction about the circumference of the

shank. Screws having flutes that define an angle of about 90 degrees in a direction about the circumference of the shank are easier to manufacture than, for example, spiral flutes as disclosed in Holmes et al.. However, when using just one such flute there is a possibility, depending on the length of the screw, that when the screw is being driven into the work piece, fibres of the piece will compact to a degree that penetration is impeded, and the screw thread will ream out the hole rendering the screw ineffective. Two flutes defining two cutting edges allow the screw to more effectively bore into the work piece and remove the fibres without reaming out the hole.

Claim 22 is unanticipated by, non-obvious and patentable over the prior art of record, including particularly Holmes et al. and Holmes et al. in view of Peck, in that none of the references show or suggest, in combination or alone, a screw having a shank being of substantially constant maximum radius between the head and the tip, a drill section having a pair of flutes defining a pair of bore cutting edges at the tip of the shank, where each flute defines an angle of about 90 degrees in a direction about the circumference of the shank, and a screw thread formed on the outer surface between the head and the tip and terminating at the bore cutting edge.

Peck fails to disclose or suggest, among other things, a pair of flutes defining a pair of bore cutting edges. Holmes et al. disclose a pair of a flutes but fail to disclose or suggest, among other things, that each flute defines an angle of about 90 degrees in a direction about the circumference of the shank. Moreover, there is no suggestion or motivation in the references to combine the references to make a screw as claimed in claim 22.

Therefore, in view of the foregoing, claim 22 is submitted as being patentable over the prior art references of record.

Conclusion

In view of the foregoing, consideration and allowance of claim 1-15 and new claims 16-22 is requested.

\* A check in the amount of \$100.00 is enclosed in payment of the fee for added claims.

The Commissioner is hereby authorized to charge any deficiency or overpayment of the required fee to Deposit Account No. 19-1345.

Respectfully submitted,



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\*Enclosures

Express Mail Label No. EV 504796892 US  
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# APPENPIX A (page 1 of 2)

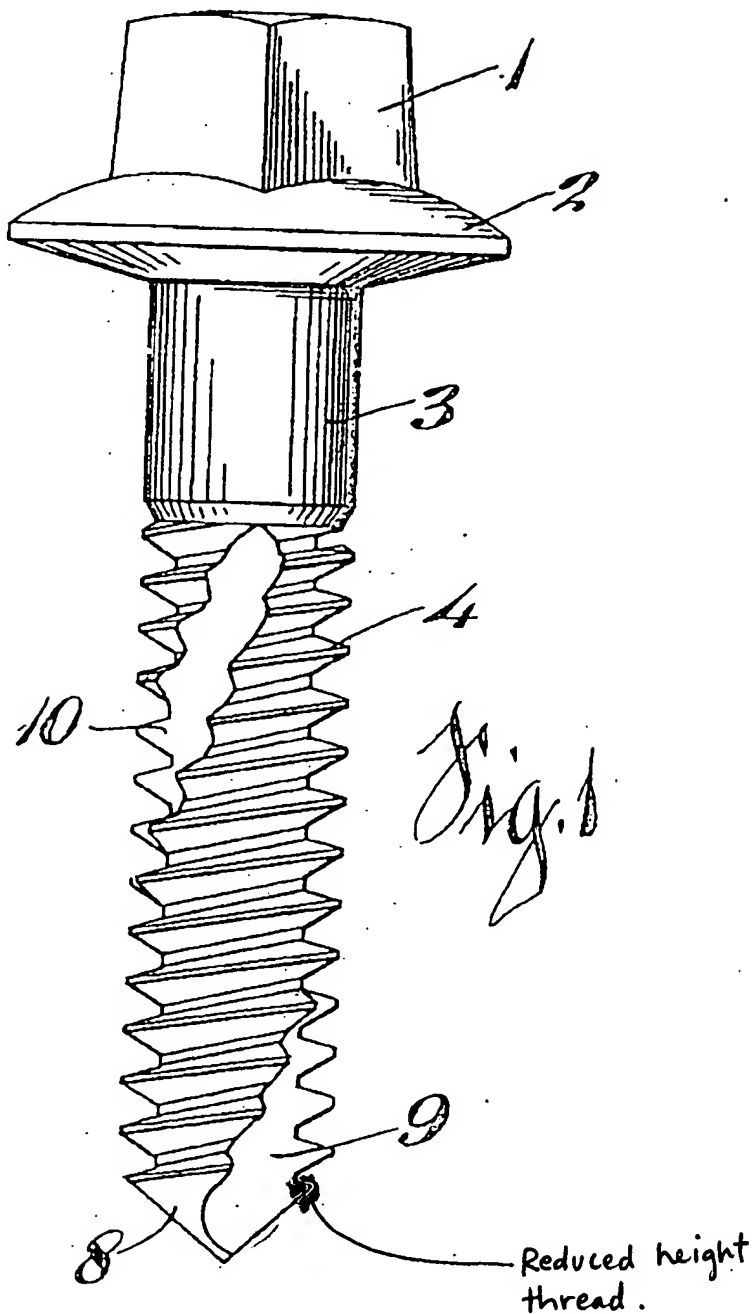


E. C. HOLMES.

SCREW SPIKE.

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1,294,268.



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Patented Feb. 11, 1919.

APPENDIX A (page 2 of 2)

